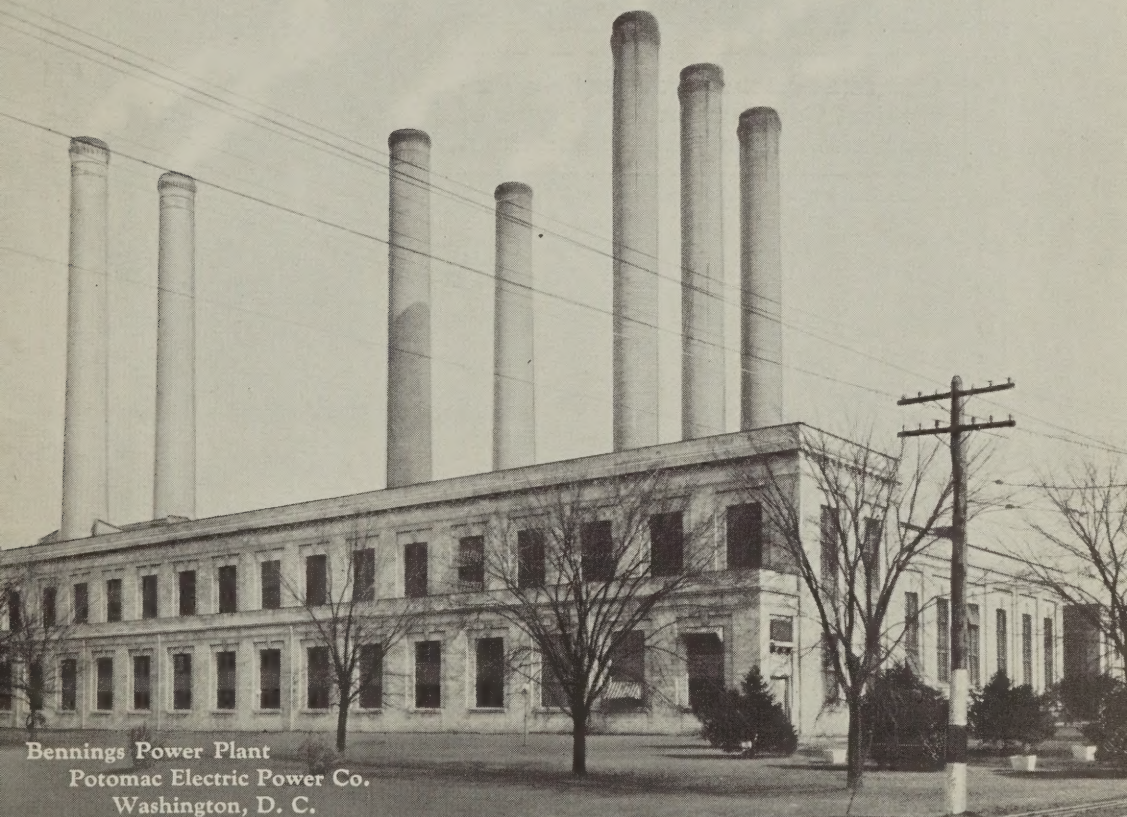
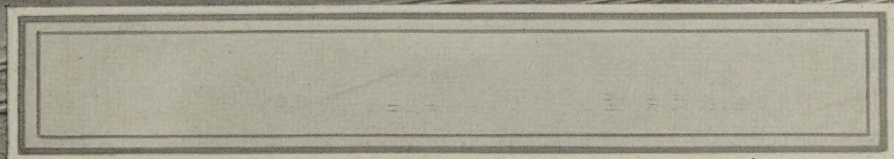


Industrial Buildings *of* Concrete Masonry



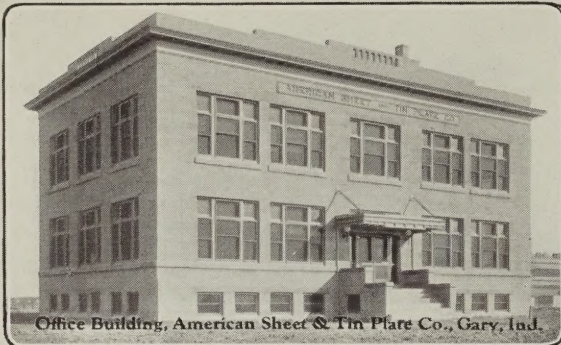
Benning's Power Plant
Potomac Electric Power Co.
Washington, D. C.

Concrete for Permanence



Published by

PORTLAND CEMENT ASSOCIATION



Office Building, American Sheet & Tin Plate Co., Gary, Ind.

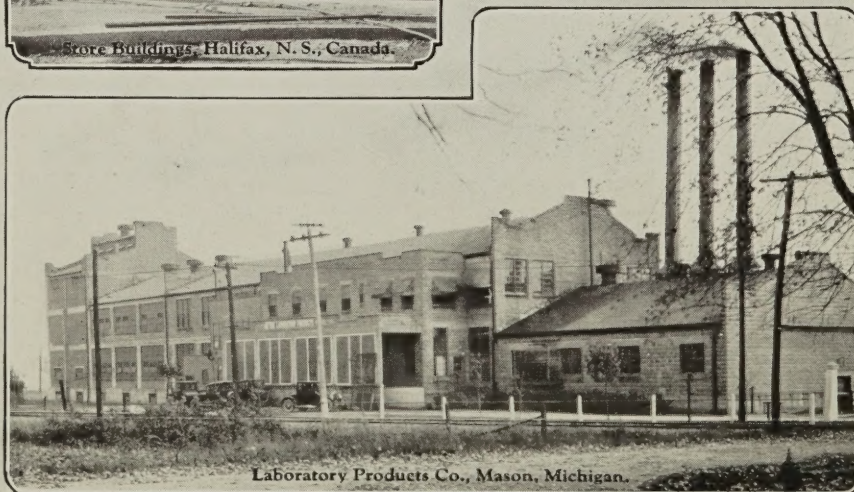
Concrete Masonry provides Safe, Economical Construction for all types of industrial and mercantile buildings.



Store Buildings, Halifax, N. S., Canada.



Power House, Mooseheart, Ill.



Laboratory Products Co., Mason, Michigan.

Industrial Buildings of Concrete Masonry

CONCRETE masonry construction is being used today for thousands of industrial and mercantile buildings, including stores, shops, garages, factories and warehouses.

The rapidly increasing popularity of concrete masonry is due to its many distinct advantages. Few other methods of construction combine to an equal extent economy of first cost, low maintenance, security against interruption to business by fire, substantial, pleasing appearance and long life.

The advantages offered by concrete masonry for industrial structures are of equal importance whether viewed from the angle of continuous owner-occupancy, rental or resale. Concrete masonry offers sturdy, rigid construction that will withstand and dissipate the vibration of heavy machinery year after year. It will resist the most severe conditions of wear and tear likely to be encountered, protect the lives of building occupants, save valuable stocks, and insure the business against interruption by fire. Not only are concrete masonry buildings a safe investment, but their staunch, permanent construction proclaims the sound ideals of the owner, gives employees a sense of pride in the business and is sure to attract customers.

Economical to Build and Maintain

The initial cost of concrete masonry is usually no greater than that of ordinary industrial construction. It costs little more, if any, than for less dependable types, the difference seldom exceeding a year's painting and repair bills on the latter.



Maintenance costs are reduced almost to the vanishing point where concrete masonry construction is used.

There is so little depreciation with concrete masonry that first cost and ultimate cost are practically the same. This economy is usually emphasized further by many incidental but direct benefits such as freedom from rats and vermin and reduction of insurance carried on building and contents.

Concrete Masonry Cuts Fire Losses

According to a recent statement by the National Board of Fire Underwriters, fire losses in America during 1922 amounted to a half billion dollars. Damage due to *exposure* far exceeded that from any other cause and was approximately 20 per cent of all fire losses of known origin. *Exposure* is the term used to classify fires that are communicated from some outside source, as where one building is ignited by flames from another. Fires of such origin may be entirely eliminated in properly constructed buildings where the walls are of concrete masonry and the roof is covered with fire-resistive concrete roofing tile, cement asbestos shingles, or reinforced concrete slab construction.

Interruption to business is one of the most expensive consequences of fire. Losses of this kind are largely non-insurable, except in the broader sense by building of *fireproof* materials. Loss of business property by fire wipes out stocks, destroys records and interrupts profit-earning activity for long periods and in the meantime one's customers are being served by his competitors. Insurance policies often cover only a minor fraction of the losses actually sustained.

No owner can afford to disregard the greater safety to life and property, that comes from building with modern concrete masonry.



Concrete masonry walls are quickly erected—the large units are easily and quickly handled and take only a small amount of mortar.

Strength and Rigidity

The extraordinary rigidity of concrete masonry makes it especially suitable for the walls of industrial buildings which contain heavy, rapidly-moving machinery likely to cause vibration. Concrete floors are particularly effective in absorbing vibration, thereby prolonging the life of the machinery and increasing general efficiency. The usual method of supporting concrete floors on concrete masonry walls is to rest them on the inner half of the horizontal wall section; metal fabric or wire mesh being laid over the exposed openings in the block or tile to prevent concrete from falling into the spaces below. Veneer block are placed on the outer edge leaving a small continuous air space between veneer block and floor slab. The floor is not extended over the entire width of the wall as the slab is likely to detract from the appearance of the wall.



Concrete masonry walls have such extraordinary stability that they readily absorb the vibration of the heavy machinery in this printery



Concrete masonry walls permit large window areas admitting the daylight so necessary to efficient workmanship.

Attractive Exteriors Easily Produced with Concrete Masonry

While industrial buildings are erected primarily for utility, appearance is also important in most cases. A business institution, whether large or small, is judged by the type of building or buildings in which it is housed. Tenants or prospective buyers are more readily interested if the appearance of the structure is attractive.



Utility and beauty are combined in this concrete masonry filling station at Toledo, Ohio.

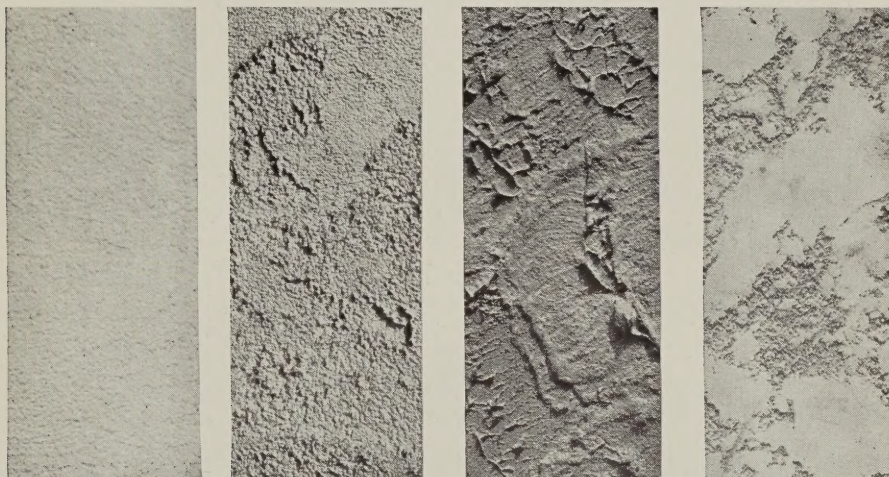
Standard flat-faced concrete masonry units without special surface treatment are commonly used for large mill, factory buildings and warehouses, and for such purposes are often considered of suitable appearance. For finer looking buildings, however, flat surfaced granite-faced block are recommended, or an attractive finish of textural portland cement stucco may be applied to the surface of plain block. For the more pretentious structures, flat, granite-faced block with a modest display of precast concrete architectural stone gives treatment that is dignified and appropriate in every way.

The owner or architect may select practically any color or surface texture from a wide range which can be secured; in this way, surfacings may be chosen which are perfectly adapted to the requirements of the building and its surroundings.

An Ideal Base for Portland Cement Stucco

Portland cement stucco heretofore widely applied as a surfacing for residences and other buildings of moderate size, may now be used with equal facility on industrial buildings. The use of concrete masonry makes

artistic plastered surfaces very desirable, providing as it does, the ideal backing for stucco. So strong is this bond that it is usually impossible to separate the stucco from the masonry base without removing part



Any of these four portland cement stucco textures will give a serviceable and attractive appearance to concrete masonry buildings.

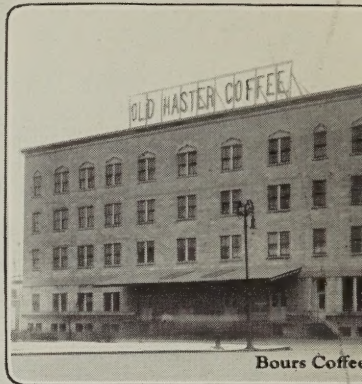
of the latter. Our booklet "PORTLAND CEMENT STUCCO" gives complete specifications for applying stucco and contains a number of panels illustrating attractive stucco finishes. Copy will be sent free upon request.



Concrete masonry has no equal as a base for portland cement stucco

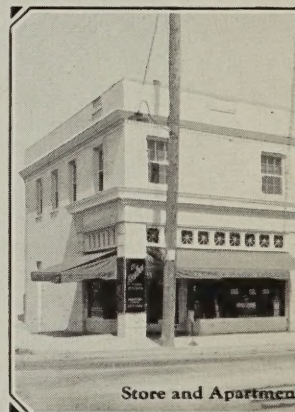
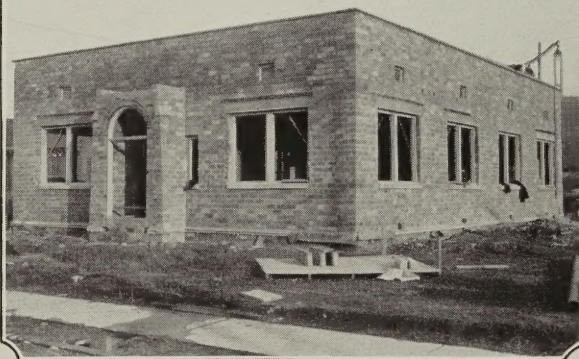


Dixie Mercerying Co., Chattanooga, Tenn.



Bours Coffee

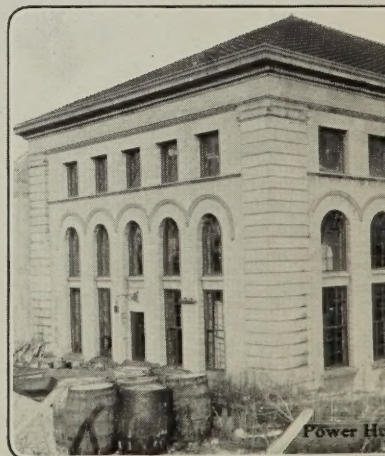
No industrial b
is too severe for



Store and Apartments



Lucerne Park Fruit Assn., Florida.



Power H



Co., Toledo, Ohio.

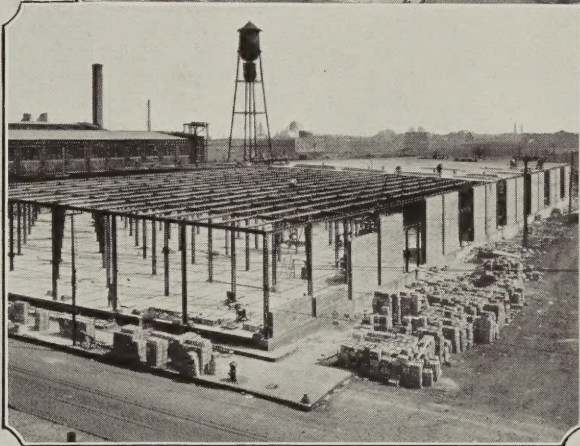


Warehouse, Marquette Cement Mfg. Co., Chicago, Ill.

Building requirement
Concrete Masonry.



Building, Monterey, Calif.



Lockport, Ill.



Cortland Savings Bank, Cortland, N. Y.

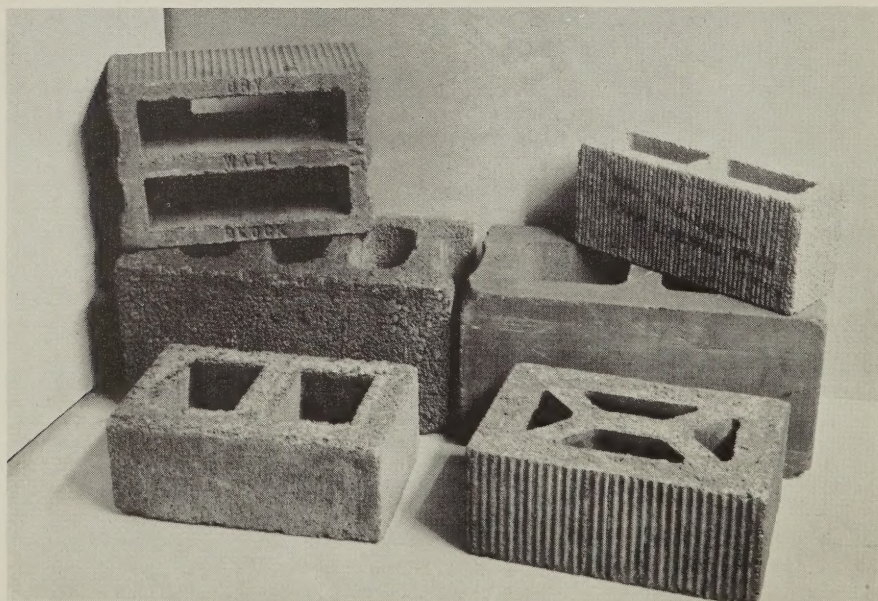
Building Units of Uniform Strength, Size and Shape

Concrete masonry units guaranteed to conform to American Concrete Institute specifications are now made in factories where every operation in their manufacture is closely supervised. The units are molded in convenient sizes and shapes, after which they are carefully cured in order to develop maximum strength. Each unit is true to size and shape with even faces, and straight, well defined edges. These characteristic qualities account in a large measure for the ease and speed with which they are laid.

Practically every community throughout the country is within convenient shipping or trucking distance of a concrete products factory or building supply dealer who carries ample stocks of concrete building materials. The builder is, therefore, reasonably certain of prompt delivery.

Common Types of Concrete Block and Tile

Concrete block and concrete building tile are the most popular and most generally available types of concrete masonry units. Block are made in several sizes, the 8 by 8 by 16-inch unit being commonly



Common types of concrete block and concrete building tile.

recognized as standard. Each block of this size has a volume approximately equal to 13 brick. Laid in single thickness, concrete block produce a masonry wall, 8, 10, or 12 inches thick, with courses 8 inches high. Veneer and partition block can be had in 4 and 6-inch widths. These are well suited for all non-bearing purposes. Walls of practically any required width may be built either by using a single thickness of block or by the proper combination of block of the same or different

widths. For example, 8, 10, and 12-inch walls can be obtained by using single thicknesses of either solid or hollow block of these widths. A 12-inch wall can also be secured by a combination of 8 and 4-inch units; a 16-inch wall can be made with 2 thicknesses of 8-inch block or by a combination of 4 and 12-inch block. Walls of greater thickness are obtained in a similar manner.



Hollow wall construction insures dryness and provides insulation against heat and cold.

Concrete building tile are smaller in size and have somewhat thinner wall sections than block, the standard size being 5 by 8 by 12 inches, equivalent in volume to 6 common brick. The height of 5 inches is equivalent to two courses of brick. As in the case of block, concrete tile are suitable for constructing walls of practically any thickness that may be required. Walls 8 and 12 inches thick are obtained by a single thickness of the tile, according to the way it is turned in the wall. The 12-inch thickness is also obtained by a combination of an 8-inch tile and a 4-inch tile, the latter being made in the 4-inch width especially for the purpose. Other combinations of 4 and 8-inch units will give walls 16 or 20 inches thick.

Insulation Afforded by Hollow Masonry Walls

Air spaces affording insulation against heat and cold are provided in concrete masonry walls, either by means of cores formed in the units or by a two-piece construction that produces a continuous opening between the inner and outer sections of the wall. In the latter case, the two wall sections are bonded together by means of metal ties or by the overlapping of concrete lugs that are cast integral with the block. In both the hollow and the two-piece block the proportion of air space varies up to 40 per cent of their volume, but in most common types it approximates 33 per cent. The air spaces in concrete tile occupy from 50 to 75 per cent of their gross volume. Where extraordinary strengths are required, such as in courses directly supporting concentrated loadings, solid units are used.

Building Code Requirements Easily Met

The most exacting building regulations are easily met and usually exceeded with concrete masonry. Individual units are capable of carrying from 10 to 30 times the load ordinarily imposed upon them in building construction. When laid in portland cement mortar, which should always be specified in first-class work, walls of exceptional strength are produced. The high initial strength of concrete masonry walls is not only maintained throughout the life of the structure but actually *increases with age*.

Concrete Masonry Satisfies Every Construction Requirement

Concrete masonry readily satisfies every construction requirement. It is used for load bearing exterior walls, non-load bearing walls, curtain walls or partitions. In most cities building codes specify strength requirements for standard construction materials and designate wall thicknesses and other details governing their use. Eight inches is usually specified as the minimum thickness for exterior load bearing walls and is generally allowed for one story industrial buildings having ceilings of medium height. For buildings with high ceilings, however, thicker walls are usually specified unless other provisions are made to obtain the required stability. Partition walls, floors, and roof, properly constructed, contribute a certain measure of stability to exterior walls and are considered in careful design.

In buildings with long stretches of walls or with high ceilings, added stability is commonly secured by means of concrete masonry pilasters or buttresses built at intervals along the wall. Where great wall stability is required, as in buildings several stories high, concrete



Factory building of the Auburn Automobile Co., Auburn, Ind. Concrete masonry pilasters give additional stability to the walls.

masonry pilasters may be made solid by filling the cores of the units and the central enclosure with a fairly rich mixture of concrete. Vertical reinforcing steel may be used conveniently. Concrete masonry pilasters are also frequently used to encase steel columns.

Wall Thickness Determined by Loading

The thickness of bearing walls in heavily loaded buildings is properly governed by the load to be carried. The allowable working load on concrete masonry units when laid in lime-cement mortar is commonly placed at $\frac{1}{10}$ the average crushing strength or when laid in portland cement mortar at $\frac{1}{8}$ the average crushing strength. In most codes, load-bearing block and building tile are required to have an average crushing strength of at least 700 pounds per square inch over the gross cross-sectional area of the unit as laid in the wall. This means that a standard 8 by 8 by 16-inch block is required to sustain a total load of at least 90,000 pounds before failure. A minimum wall thickness of 8 inches has been commonly adhered to regardless of load, largely for reasons of stability and convenience in construction.

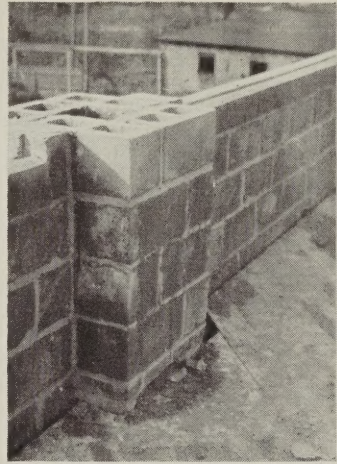
Portland cement mortar is specified in first-class construction because of its strength, density and strong bonding power. Concrete masonry units are designed to provide an adequate bed for mortar, a feature which insures a wall of maximum rigidity.

Manufacturers regularly carry stocks of corner block, door and

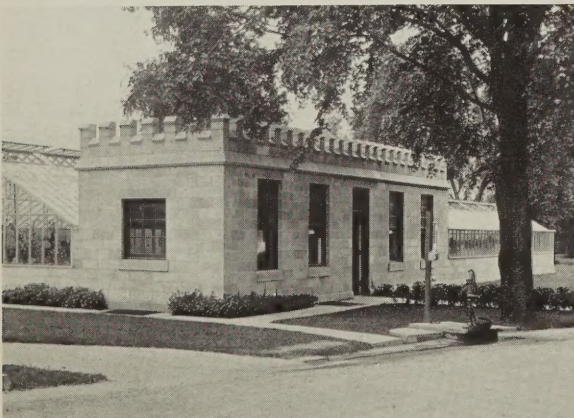
window jamb block, sills, lintels, and all other specials required to produce first class construction with economy of labor.

All-Year-Round Construction Material

Industrial buildings may be built of concrete masonry almost as well in winter as in summer. During the winter of 1923-24, 5,000,000 concrete

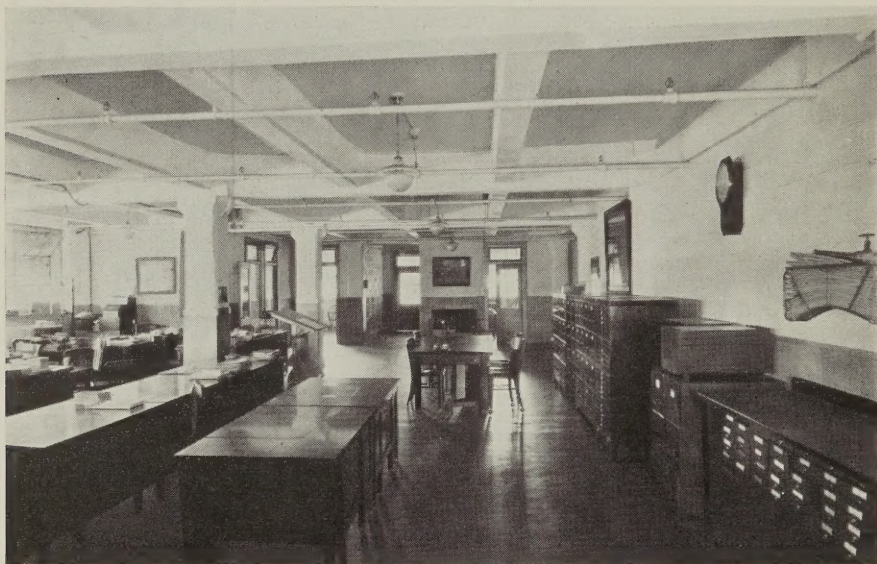


Common method of building concrete masonry pilaster.



Service and attractiveness have been built into this office building through the use of concrete masonry.

masonry units were used in building construction in Michigan. Of this number 1,800,000 block and 2,000,000 building tile were laid in the city of Detroit alone. Minneapolis used over 2,000,000 block during the same time. These examples are representative of conditions throughout many parts of the country.



Partition walls in this modern office are constructed of concrete masonry.

For winter construction, concrete masonry has several unique advantages. Walls are erected quickly. The large size of the units reduces the volume of the joints, with less mortar material to heat. The warmth retained in each block or tile as laid protects this small volume of mortar against freezing. Protection of the wall until the mortar has hardened, which is necessary only in extremely cold weather, is not usually attended by any great difficulty. Due to favorable labor and material conditions, winter construction seldom costs more than that carried on at other seasons of the year. Any slight additional costs are usually offset by saving of interest on investment and by increased returns due to earlier occupancy.

No Requirement Too Severe for Concrete Masonry

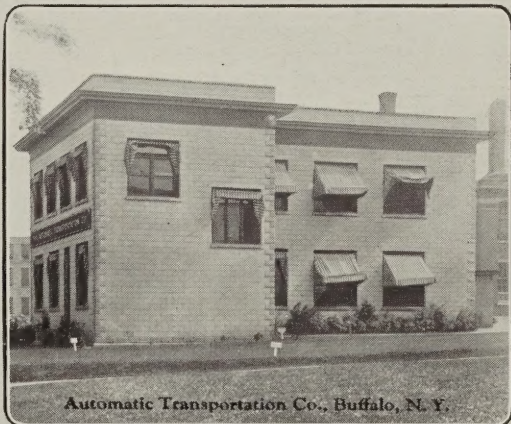
Unforeseen demands may be imposed upon a building by change in occupancy or other causes, but buildings of concrete masonry have such extraordinary reserve that they readily satisfy all ordinary requirements regardless of the character of the tenancy.

Sound, economical, fireproof and attractive, concrete masonry enjoys steadily increasing popularity for industrial and mercantile building requirements. Concrete masonry construction may be depended on to serve indefinitely with modest upkeep and slight if, any, depreciation.



Factory Building, Tuckahoe, N. Y.

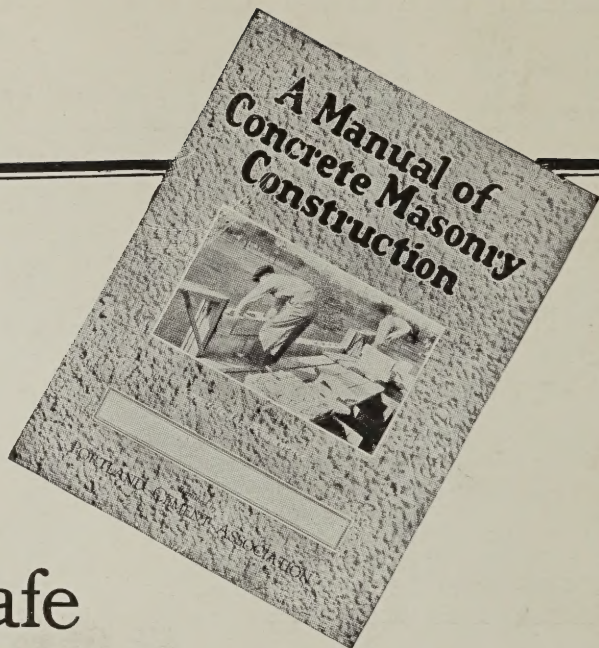
The popularity
of Concrete
Masonry has re-
sulted in its use
in thousands of
industrial and
mercantile build-
ings through the
country.



Automatic Transportation Co., Buffalo, N. Y.



Warehouse, Marquette Cement Mfg. Co., Chicago, Ill.



Safe Economical Construction

Every detail of Concrete Masonry Construction is fully explained in our booklet, "A Manual of Concrete Masonry Construction." Copy will be mailed to you on request.

PORTLAND CEMENT ASSOCIATION

A National Organization to Improve and Extend the Uses of Concrete

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